ON THE PRESENCE IN BONE MARROW

Of an active Principle of Value in the Treatment of Some Skin Affections.

A Clinical and Therapeutic Study.

By

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1892.

My object in this thesis is to submit evidence in favour of the view that the bone marrow contains a substance of distinct therapeutic value in the treatment of some common skin affections. The clinical records submitted as evidence, have been collected in the course of the past three years (1901-1903). The ideas which led to the investigations may be shortly stated in a few introductory remarks.

Introduction. In the course of six months daily observation of skin affections in the In and Out-Patient Department of the Royal Infirmary in 1895-6 I was led to doubt the correctness of the commonly accepted teaching as to the purely local origin of many cutaneous affections. Observation of cases in the wards convinced me that in the great majority of ordinary skin affections, a careful general medical examination of the cases from the standpoint of the general physician revealed facts of importance re the etiology of the disease. A study of the temperature chart, noting carefully sub-normal variations as well as elevations of temperature, observation of the general and particularly of the cutaneous circulation in the affected and unaffected areas of the skin, and the amount and character of the renal and alvine

alvine discharges were the special points to which attention was directed. Temperature variations, a defective capillary reaction of the skin sometimes with constriction of the radial arteries, and a deficient amount of urinary and alvine discharge with marked foetor of the latter, were very frequently observed and these symptoms usually improved or disappeared coincidentally with the disappearance of the skin eruption. These facts strengthened my belief that the system of regarding skin affections as primary diseases of the skin was an erroneous one; and they prepared the way for enquiry to determine the accuracy of this view.

An appropriate line of investigation was suggested to me by two facts learned some years ago. In 1897 I had under my care a factory girl affected with chronic and severe palmar eczema. She had been under treatment as an Outpatient in the Skin Department of the Royal Infirmary for three months in which time several of the usual remedies had been tried ~~but~~ without material benefit. For a few weeks I tried some variations in local treatment that suggested themselves after careful perusal of the prescriptions which she had received at the Royal Infirmary. These were equally unsuccessful, and I lost sight of the

the patient. About a year afterwards I was informed by a friedn of the patient that the hands had ultimately been completely cured as the result of 'an old wife's remedy' the use of marrow from a bone. At a personal interview later the patient informed me that recovery had taken place within a very few days of the commencement of this treatment. The marrow preparation was obtained by boiling a bone, and skimming off the fat which was rubbed into the affected part.

A further point which came under my notice about this time impressed me considerably. I was then engaged in an investigation on the articular changes in animals in rheumatism and allied conditions. This investigation was largely carried out at the 'Knackeries' at Loanhead, and in the course of it I examined over two hundred subjects; in a little more than one half of this series I examined the local and general condition of the animal just before death, and in all of them I studied the appearances of the organs and tissues very soon after the animals were killed. The most outstanding feature in the post-mortem examination was the altered state of the bone marrow. It was found that this structure was often profoundly altered even in cases in

in which the viscera and joint structures were relatively normal. The changes in the marrow were mainly those of a 'leucoblastic' nature, with, in many instances, gelatinous degeneration. The naked eye appearances were similar to those which have since been fully described by Muir as present in man in various infections. These facts learned five years ago, led me to entertain the view that the bone marrow had some physiological and therapeutic properties of a nature previously unknown.

In broad outline my theory is that the bone marrow produces an internal secretion of vital importance in the economy; that this substance assists in the prophylaxis against the injurious action of various bacteria which in health exist as saprophytes indifferent tissues; and that its defective production is liable to be followed by a pathogenic action of these same microorganisms. The results of this patho-genic acting vary much in different subjects, in accordance with the all important factor of individual reaction. As the main ~~sights~~ sites of these bacteria are the respiratory tract, skin, alimentary tract, and vagina, it follows that diseases will be more or less directly associated with one or more of these surfaces as the main source of infection. I there-

therefore determined to test the value of a preparation of bone marrow in as many skin cases as possible. The preparation employed was an ethereal extract, made as follows:-- Marrow was taken from fresh long bones of an ox, great care being required in the selection of the bones (see p. 77); it is then extracted with ether for about thirty-six hours, the ethereal extract being evaporated down in the open. A solid fat remains which has a characteristic odour. One per cent Chloretone is added for purposes of preservation. (The initial therapeutic experiments were carried out with freshly made preparations to which no preservative was added).

My investigations have been limited to the use of this particular preparation of bone marrow.

My object in every instance has been to introduce this substance into the circulation through the raw or abraded surface, usually over a limited part of the affected area. As a preliminary, the cutaneous circulation was excited by means of bathing with hot water, in order to facilitate absorption.)

In nearly all the cases the treatment was carried out by myself or under my immediate supervi-

superivsion; a considerable amount of time and trouble being necessary for an efficient trial of the treatment. As far as possible cases were obtained which had proved refractory to ordinary treatment, and in view of the well-known fact that some skin affections occasionally undergo spontaneous cure in a remarkable manner, control observations such as are fully described on p. 18, were frequently made in order to minimise the risks of fallacy in the deduction. My sole objects in these investigations was to determine whether this preparation of marrow possessed some therapeutic property; I am not concerned with a detailed comparison with the results obtained by other forms of treatment. The first two records, those of Lupus and Psoriasis, are given in full detail as they illustrate clearly the care necessary to obtain a suitable preparation of the marrow and the careful oversight required in the use of the remedy. The remaining cases are summarised. With two or three exceptions none of the cases were indoor patients and on this account the records from the point of view of the general medical bearings of the cases, are incomplete. On the conclusion of the clinical records some notes will

will be added referring to

I. The preparation of marrow used (Myelocene[1])

II. Results of attempts to ascertain the exact chemical composition of marrow which yielded a therapeutically active substance, and marrow which was not therapeutically active.

III. The evidence of the existence of an active therapeutic substance in the preparation of bone marrow used. (Myelocene).

Note 1. The term myelocene is applied to an ethereal extract prepared in the manner described on page 5.

LUPUS VULGARIS

Of

5 Years Duration.

My object in investigating this case was a twofold one. In the first place I wished to determine what effect, if any, the local application of myelocene would exert upon the pyogenic bacteria which are the complicating factors in most cases of lupus vulgaris, and which impart to that disease its characteristic ulcerative features; and secondly, to ascertain what influence would be exerted on the tuberculous nodules which are the essential lesions of the disease. The history and clinical features of the case were as follows:-

J. F., aet. 9, suffered from a patch of lupus on the left cheek of about five years' duration. Advice was sought because the disease was extending. The hereditary history showed a marked proclivity to tuberculosis, five aunts and two cousins having died from tuberculous disease. The percussion note over the apices of the lungs was defective; in other respects the patient's general health and

Fig 1

Fig 2.

and previous history were satisfactory.

The situation and character of the lesions are well shown in Fig. 1 . The circumference of the encrusted area was four and one-fourth inches, beyond which there extended a marginal zone of active hyperaemia. There was a marked enlargement of a submaxillary gland underneath the chin on the left side. The treatment adopted was as follows:-

1. The part was bathed with hot water in order to,
   (a) remove the crusts as far as possible, and
   (b) to stimulate the circulation in the part.

This operation took from five to seven minutes. The removal of the crusts revealed a typical lupoid surface, which was very irregular in character, being deeply pitted at some parts and markedly raised in others, and studded with yellowish nodules, the whole surface showing a tendency to bleed. In the middle of the lower third there was a small whitish spot which apparently represented an area of central healing.

2. The surface was then carefully dried with a clean piece of white cloth, and thereafter myelocene, previously liquefied and warmed, was

was applied with a pipette. About one drachm was used, this being applied in relays, the oil being rubbed into the part as thoroughly as the tenderness of the surface would allow.

The patient was treated daily, the treatment being invariably carried out by myself. An immediate improvement was manifested. The peripheral hyperaemia was reduced, the scabs largely disappeared, the surface became smoother both to appearance and to palpation. On the fourth day no bleeding attended treatment. Fig 2. taken a week after commencement of treatment, shows a marked improvement. All the crusts had disappeared except a small one in the upper and anterior part; the whole surface was deeply congested, with a tendency to scaling; the small, pale area in the lower part was more distinct. The subsequent progress was very satisfactory. The congestion of the surface gradually lessened; the pale area in the lower part extended and a similar pale area appeared in the upper part, the two gradually meeting. Soon the individual tuberculous nodules became visible. The tendency to scaling persisted (see Fig 3.). After thirty-seven days' treatment the improvement was very pronounced, and

and the patient was exhibited at the Jouly meeting of the Edinburgh Medico-Chirurgical Society. A continuation of the treatment was effectual in bringing the individual tubercle nodules into more marked relief, but the nodules themselves were not apparently influenced. The conclusion was therefore arrived at that the treatment had been effectual in changing the disease from a complicated to a simple form but that there had been no curative effect on the tuberculous lesions proper. In order to determine the permanency of the improvement in the catarrhal process, all treatment was stopped for two and one half months, at the end of which time the improvement was found to be fully maintained (see Fig. 4. taken on October 30, 1902).

A second step in treatment was begun on October 30. This consisted in the application of a caustic to each nodule, acid nitrate of mercury being used, the application being made by a pointed wooden match soaked in the caustic. The local application of myelocene was resumed and continued as formerly, after the preliminary treatment by hot water. One-half of the nodules were treated with the caustic on October 30, the remaining half a fortnight later. The result was very gratifying. The process of

of healing was remarkably rapid; the nodules appeared to be completely destroyed. At the end of a month the condition was so satisfactory that the patient was exhibited for the second time at the meeting of the Edinburgh Medico-Chirurgical Society (December 5, 1902). A moderate degree of general congestion was still present over a large area of the affected part. This has gradually disappeared, without treatment, and three and one-half months later the condition was one that may be described as extremely satisfactory (see Fig. 5.). There are still present three or four small points that are not above suspicion, although they do not give the distinctive diascopic reaction of lupus nodules; these suspicious points stand out more prominently in the photograph than they do in life. The special features of the result are the entire absence of any cicatricial contraction and the ease and rapidity with which the result was attained. In these and in all other respects the result compares very favorably with even the most recent methods of treatment by photo-therapy.

The subsequent history of the case is thoroughly satisfactory. The patient was last seen in

in March 1904, when the local condition was found to be materially better than that shown in Fig. 5. There has been no recurrence of the disease and the general appearance of the part is, except on minute inspection, normal.

R E M A R K S.

One of the most striking features in the treatment of this case was the remarkable rapidity of the improvement that took place. It is no exaggeration to say that within twenty-four hours the improvement was very marked indeed; and this was all the more gratifying in view of the fact that the home surroundings of the child, as to cleanliness, were of the worst possible description. Figure 2 illustrates the degree of change effected by a week's treatment. The scabs have been almost completely removed and are not re-forming; the general surface of the lupus patch has been leveled; the surface is markedly hyperaemic, the congestion obscuring the tubercle

tubercle nodules; the pale spot in the middle of the lower third of the patch just indicating the tendency to central healing characteristic of the disease. The rate of improvement after this date was not so great, which may perhaps be accounted for by the fact that at this time several experimental observations were made, viz.:

1. For a few days the patient was treated twice daily. The result was not satisfactory, the diseased area showing distinct indications of irritation, which ceased on the resumption of a single daily treatment.

2. Variations were made in the length of time and degree of heat employed for stimulation of the vessels of the part by the hot water. It was found that it was easy to overdo this part of the treatment.

3. Similar variations were made in the use of myelocene, its temperature on application, and the duration of inunction. Here, again, it was found that harm resulted from excess. Careful daily observation was necessary to determine the exact amount of treatment necessary. The degree of hyperaemia present was taken as the guide.

I have gone into these points in detail more

more especially because the lessons learned from them confirm the results of similar observations in other skin diseases. They clearly indicate that a failure to get a good result by this method of treatment may in some instances depend on a faulty use of the remedial measures. After three weeks' treatment the enlargement of the submaxillary gland on the affected side had completely disappeared. At this time the surface showed a marked tendency to scaling, as represented in Fig. 3. which also shows how the pale, healthy areas were extending, leaving the tuberculous nodules more sharply defined. A continuation of the treatment at this time led to no further change of note and it became obvious, in terms of our original inquiry, that the treatment had exerted a profound influence in a favourable direction on the pyogenic catarrhal process of the disease, and no apparent influence on the lupus nodules. It was gratifying to note that the improvement was fully maintained after two and one-half months' cessation of treatment.

In connection with the second part of the treatment, the rapidity of the improvement under the influence of the combined measures employed, was equally striking. And it is very satisfactory

satisfactory to note that four months later the improvement has not only been fully maintained, but is actually progressive. Attention has already been drawn to the entire absence of any cicatricial contraction in the part.

I have had no further opportunity of treating cases of Lupus. The results in this case suggested a further trial of Myelocene in cases of an impetiginous nature, and the results of this investigation are given later.

We pass now to the record of Psoriasis cases. The first two cases are recorded in detail, the others are summarised.

CASE I.

PSORIASIS

of nine years' duration in an epileptic.

The patient was a man, aged 24 years. As regards history it was stated that he was healthy as a boy. When 10 years old he was affected by attacks of petit mal, which became aggravated as he approached puberty. At about the age of 14 years the fits became more severe and typically epileptic in character. Treatment did not effect any improvement. When aged 15 years he was treated as an in-patient in the wards of the Edinburgh Royal Infirmary for about six months without improvement. Psoriasis developed during his stay in the hospital. He was admitted to the Morningside Asylum in November, 1899. The skin condition was treated by local and general measures and improved materially under treatment. He was admitted to the Craiglockhart Poorhouse Hospital in March, 1901. At the time of admission there were numerous areas of psoriasis on the arms and legs with a considerable degree of irritation. The disease was kept under by daily bathing and the

the local application of tar ointment, but as soon as these measures were stopped the disease increased, large coarse scales forming on the affected areas with severe irritation of the skin. The patient remained in this state until September, 1901, when the present observations were begun. At this time the local treatment consisted in a daily bath with sanitas and the local application to the body of a tar ointment. This treatment was effectual in removing the scales, in keeping the skin fairly clean, and in making the irritation more bearable; it did not appear to exercise any curative influence.

In order to minimise the risk of fallacy in the deduction from the results of our investigations we made a series of observations, with intervals of cessation of treatment in the manner recorded.

Observation I. Preliminary, Sept. 5th, 1901. In order to test whether the local application of myelocene would effect any local change a preliminary observation was made as follows. The treatment in use was suspended and myelocene was applied to the left forearm by inunction after a short preliminary stimulation of the vessels in the skin of the part by bathing with hot water. This was continued for

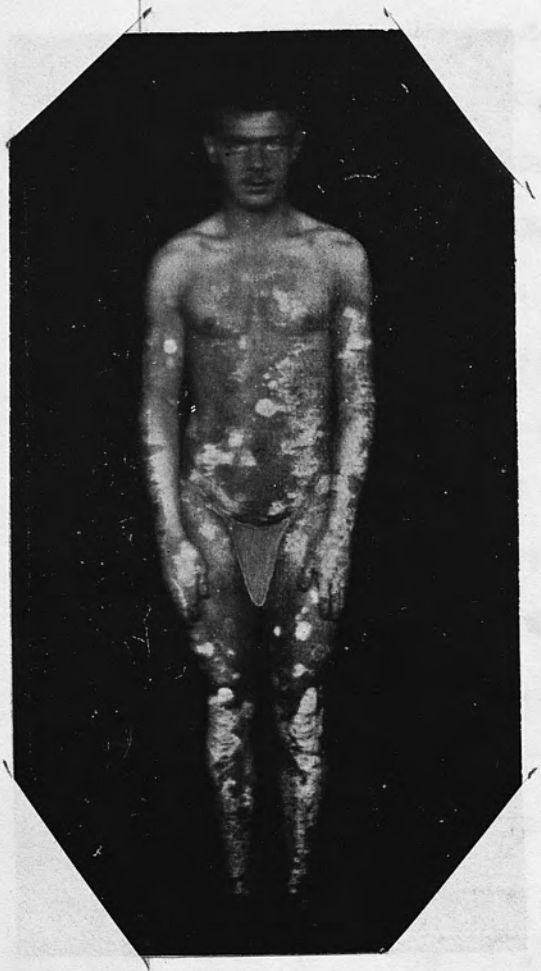


Fig 6.

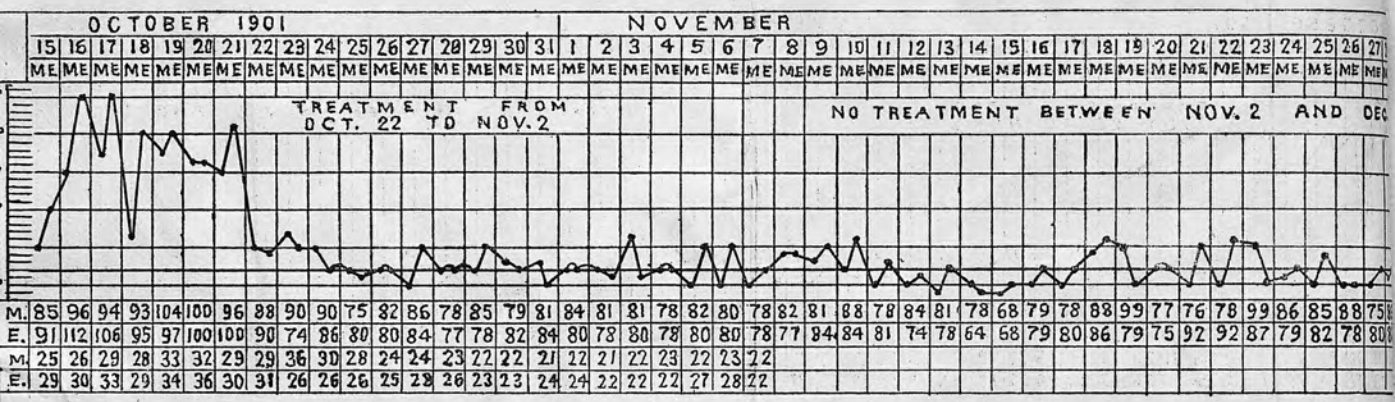
Fig 7.

for three days, a careful comparison being made of the condition in the two arms during the treatment and on its cessation. The result was a diminution in the severity of the itching in the limb treated and a lessening of the hyperaemia in it with diminished scaling. When the treatment was stopped these symptoms gradually returned but it was observed that they never became quite so pronounced as before. The results of this preliminary trial were regarded as of an encouraging nature. The old treatment was then resumed.

Observation II. All treatment stopped, Oct. 3rd, 1901. In the beginning of October all treatment was stopped and the disease was allowed to progress. The general scaling was soon considerable, being at first fine and then gradually becoming coarser, the scales falling off in showers only to be replaced by others. The irritation became intense and even painful. Some of the affected areas were even cracked and fissured. The temperature became elevated and a careful examination revealed no other cause than the severity of the skin lesion. The two reproductions from photographs (see Figs. 6. and 7.) taken after a fortnight's cessation of treatment

treatment show the general condition. The large coarse scales distributed generally over the body may be noted, being especially pronounced in the lumbar regions, the chest, the abdomen, the arms, and the legs. Note also the condition of seborrhoea of the scalp in Fig. 4. This observation appeared to show that the natural tendency of the disease at this stage was not in the direction of improvement.

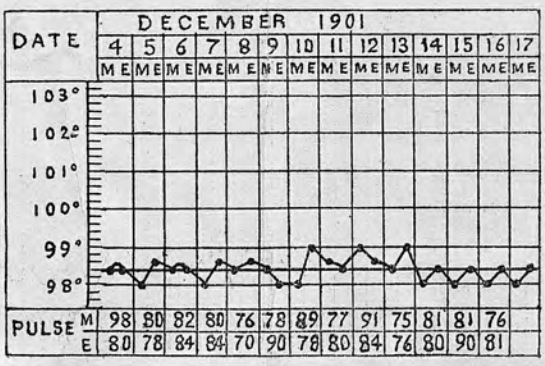
Observation III. Local application of myelocene for 10 days to the forearms only, from Oct. 22nd, to Nov. 2nd, 1901. After bathing the forearms in hot water with a little bicarbonate of soda to remove the scales so far as possible, myelocene was applied every day for 10 days. This treatment was carried out twice a day for the first two days and subsequently once daily. The results of this observation may be summarised as follows. A general falling off of the coarse scales occurred all over the body, the subsequent scaling being of a much finer type. The skin of the affected areas throughout the body became much softer and more flexible. The scalp became normal. The hyperaemia in the arms considerably lessened and at the end of this period the skin of the affected areas in the arms presented



	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME
M.	85	96	94	93	104	100	96	88	90	90	75	82	86	78	85	79	81	84	81	81	78	82	80	78	82	81	88	78	84	81	78	68	79	78	88	99	77	76	78	99	86	85	88	75
E.	91	112	106	95	97	100	100	90	74	86	80	80	84	77	78	82	84	80	78	80	78	80	80	78	77	84	84	81	74	78	64	68	79	80	86	79	75	92	92	87	79	82	78	80
M.	25	26	29	28	33	32	29	29	36	30	28	24	24	23	22	22	21	22	21	22	23	22	23	22																				
E.	29	30	33	29	34	36	30	31	26	26	26	25	28	26	23	23	24	24	22	22	22	27	28	22																				

rature Chart of Case 1. The chart shows (1) a temperature characteristic of septicæmia, probably due to septic absorption from the skin (from Oct. 15th to 22nd); (2) the fal rature associated with the local application to the forearms (from Oct. 22nd to Nov. 2nd); (3) a more unstable temperature following the cessation of treatment (from Nov. 2nd d (4) the manner in which the temperature was unfavourably influenced by the use of a faulty preparation of myelocene (from Dec. 10th to 13th).

Temperature Chart of Case 1 (*continued*).



	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME
M	98	80	82	80	76	78	89	77	91	75	81	81	76	
E	80	78	84	84	70	90	78	80	84	76	80	90	81	

presented a somewhat mottled appearance, produced by the presence of pale, apparently healing areas, interspersed among the more hyperaemic zones. The irritation diminished and in eight days from the commencement of this observation had entirely disappeared from the whole body. The temperature, pulse, and respiration altered in the manner indicated in the chart. The character of the pulse improved, becoming more regular. The results at this stage fully confirmed the favourable opinion formed from the preliminary trial. As a control observation, however, it was resolved to stop all treatment to see if the natural tendency of the disease at this stage was in the direction of cure.

Observation IV. Cessation of treatment from Nov. 2nd to Dec. 4th, 1901. No treatment was applied for four and a half weeks, the result being a gradual increase of the hyperaemia and scaling with a return of the irritation, but in a milder form than on any previous occasion when left untreated. The disease spread and involved fresh areas of the skin, but the scales were small and never assumed the large coarse type formerly present. At the same time the skin of the lumbar regions and that of the forearm gradually improved and at the end of this period were

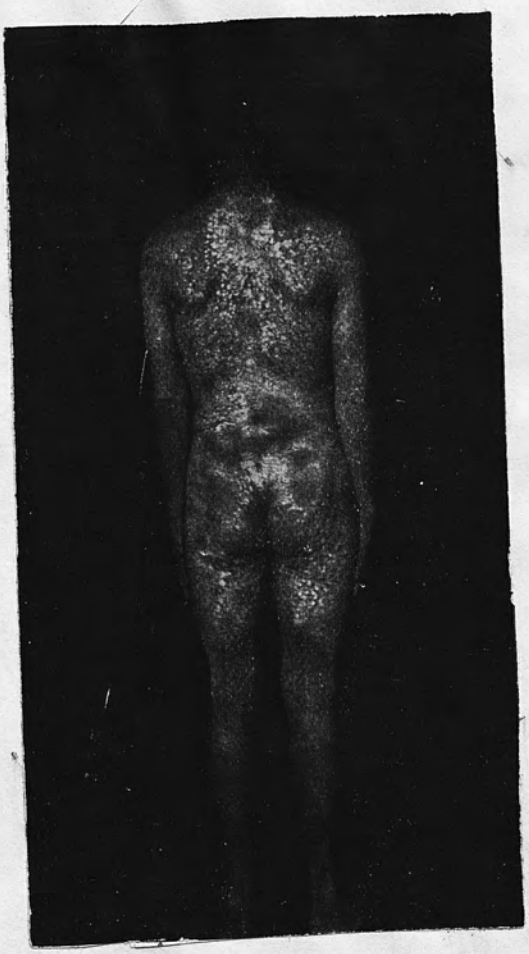


Fig 8.

were practically normal. Fig.8. reproduced from a photograph taken on Nov. 27th, gives a general idea of the manner in which the disease had spread and extensively involved regions of the back which previously had been unaffected; a similar extension had occurred on the anterior aspect of the trunk. The illustration also shows the marked improvement that had taken place in the skin of the lumbar region. The temperature oscillations in this period should be noted. It was thus clearly apparent that the course of the disease was not towards a spontaneous cure. The general results at this period suggested that the treatment had exerted something of the nature of a specific reaction and in a favourable direction.

Observation V. Resumption of treatment, Dec. 4th, 1901, to Feb. 11th, 1902. Throughout the major part of this investigation the myelocene was used in a strength of 50 per cent., the diluent being almond oil. From Dec. 4th, 1901, to Jan. 7th, 1902, the application of myelocene was made to the forearms only. From Jan. 7th to 22nd the application was made to the legs and the lower part of the thighs only. From Jan. 22nd to Feb. 11th the application was made to the right arm and leg and the left arm and leg alternately. A general outline of the results of this observation will first be made. Improve-

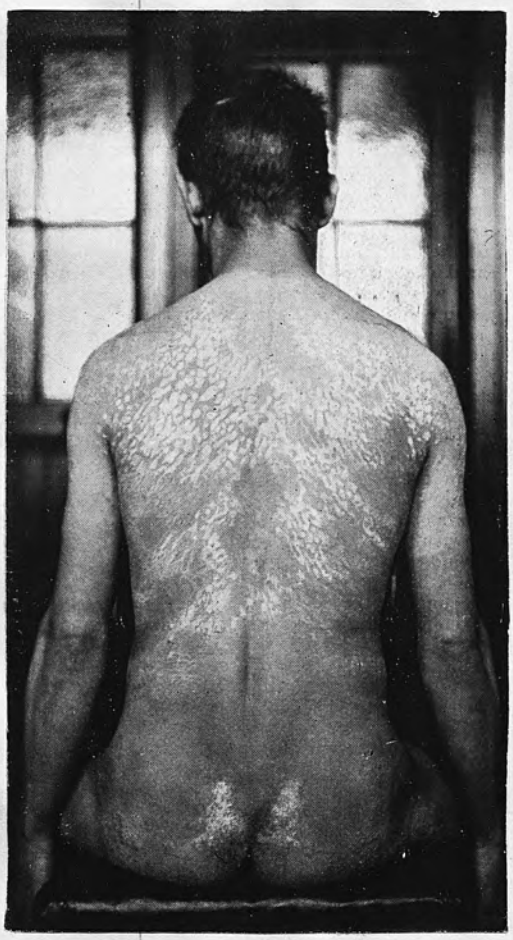


Fig 9.

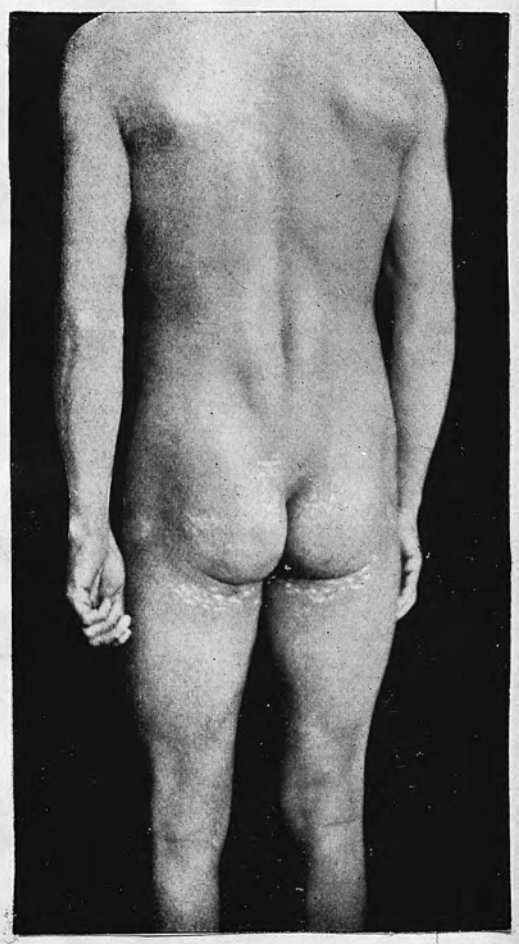


Fig 10.

Improvement set in at once and steadily increased. Fig.9. shows the appearance of the posterior aspect of the trunk on Dec. 28th, 1901. It will be observed how the healing areas are extending on all sides. A similar change took place on the front of the chest and abdomen and on the lower limbs. The irritation gradually lessened and before the end of this period it finally disappeared. Fig.10. shows the appearance of the posterior aspect of the trunk on Feb. 11th, when the eruption had disappeared except in the lower sacral and gluteal region. The reader will have observed that the trunk had not been directly subjected to any treatment. The general surface of the skin was white and free from pigmentation. The texture of the skin was delicate and soft, like that of a healthy infant. The skin of the whole body was now in this satisfactory state except the skin of the feet and a few small spots of the flexor aspect of the forearms and axillae. The temperature became normal and remained so. The results of treatment in this period confirm the favourable impressions recorded under observation iii

It is advisable to refer in greater detail to a point recorded in the course of this observation. (a) On Dec. 12th, the Resident Physician in charge

charge, who was unaware of the details of the prepara-tion--reported that since a new supply of 'bil' had come into use on Dec. 10th the general condition of the patient had not only ceased to improve but had deteriorated. The irritation had become more pronounced, the hyperaemia and scaling had increased, and the temperature had varied (q.v.) On investigation it was found that inadvertently a form of myelocene had been used which my experience had shown to be prejudicial. As soon as the use of this faulty preparation was abandoned and the right remedy was substituted improvement again set in and steadily increased. Further reference to this will be made later. (p. 77).

Observation VI. Cessation of treatment, Feb. 11th, 1902. The treatment was stopped on Feb. 11th when the condition of the trunk was as shown in Fig. 10 . On that date the only parts of the skin which were not perfectly normal were the small areas on the buttocks (as shown in Fig. 10.) and a few small spots in the region of the axillae and the feet. The last mentioned still showed very numerous spots of disease varying in size from that of a pea to that of a six-penny-piece. These were present on the outer and inner aspects of each foot. The surface was pale

pale and the scaling of the spots was fine in charac-ter and very scanty in amount. On the cessation of treatment the condition remained practically stationary. On April 30th, two and a half months after all treatment was stopped, investigation showed that the beneficial results of the treatment had been fully maintained and that no change had taken place in the diseased areas on the buttocks (see Fig. 10) and feet.[1] This last observation strongly corroborates the view suggested by the earlier observations as to the therapeutic activity of the product of bone marrow.

With the view of determining whether any important alterations in the blood pressure occurred as a result of treatment pulse tracings were repeated-ly taken before and during treatment. No marked change was observed. The tracings were kindly taken for us by Dr H. Oliphant Nicholson.

The next case treats of Psoriasis in an older subject. Particular attention is directed to the diseased states associated with the Psoriasis and to the improvement that occurred in these conditions co-incidently with the disappearance of the Psoriasis.

1. There has been no recurrence of the eruption up to February 1904.

Psoriasis of Ten Years' Duration

Associated with

Internal ear disease. Varicose Veins.
Baldness. Polyuria.

A. M., vagrant, aet. 63, admitted to Craiglockhart Poorhouse on 9th March 1902, suffering from extensive psoriasis of ten years' duration. The eruption first appeared on the thighs, and gradually extended to other regions. It was accompanied by a consider-able degree of irritation of the skin.

Previous health. Patient had always enjoyed good health. He had been accustomed to take liquor, sometimes to excess, but stated that indulgence in liquors, or abstinence from them, had exercised no apparent influence on the course of the disease. There was no history nor evidence of syphilitic infection. For some years his hearing power had been defective. In the course of the previous year, when engaged at work as an engineer's labourer, he had found that his general strength was beginning to fail, as he could not do heavy manual work with the same ease as formerly. No information regarding

Fig 11

Fig 12

Fig 13

regarding hereditary influences was available.

Present state. An extensive psoriasis eruption was present on the anterior aspect of the body--on the forearms, thighs, and legs, with isolated smaller areas over the abdomen and sides of the chest (see Fig. 11). A similarly widespread lesion involved the skin on the posterior aspect of the body, notably the lumbar region, thighs, legs, and heels. The skin of the lumbar region was very much thickened, deeply furrowed, and covered with characteristic thick white crusts, which, when detached, revealed a surface which was dull red in colour in the region of the buttocks, and brighter red in the lumbar region. The patient stated that for a long time he had not been able to stoop with comfort, owing to the extremely rigid state of the skin in the lumbar region. The extent of the eruption is indicated in the photograph (Fig. 12, and also in 14) which was taken after three weeks' treatment, which, it should be noted, was restricted to a local application to the forearms only. This treatment had effected the removal of most of the coarse scales from the legs, thighs, and lumbar region, and also a lessening of the deep furrowing in the lumbar region, which, however, is still visible in the figure. The skin of

of the unaffected areas was markedly dry and inelastic. The hair of the head was thin and unnaturally dry, and there was an area of over 2 in. square on the vertex where the hair had almost entirely disappeared. The nails showed much pitting, with irregularity in the markings.

Other systems--Cardio-vascular. The rate and character of the pulse was noted three times on one day when the patient was in bed, the rates being 63, 68, and 66. The morning and evening frequency of the pulse was subsequently noted for five days before treatment was begun: the ten readings ranged between 78 and 86. There was no abnormality in the heart sounds. The patient was the subject of severe varicose veins (see Fig. 11.).

Renal system. For a considerable time prior to his admission, the patient had been much troubled with increased frequency of micturition and inability to hold his water for any length of time. Within the last year this symptom had become so pronounced, that extreme inconvenience had frequently been experienced by the patient in his wanderings on the street. This symptom was present by day as well as by night, and led the patient to micturate five or six times during the night and more frequent

frequently during the day. The total urine was collected for three consecutive days before treatment the records being 116, 108, and 106 oz., of an average sp. gr. of 1016. There was no albumin nor sugar.

Gastro-intestinal tract. The motions were observed daily, and were noted to be frequently very dark in colour, imperfectly formed, and very offensive in odour. It should be stated that the patient's diet included a liberal supply of porridge.

Special sense--Ear. The external ears and the tympanic membranes presented a normal appearance. The tuning-fork reaction showed that air conduction was better than bone conduction on both sides. The defect in hearing was thus of "nerve" origin. The other systems appeared to be normal.

Treatment And Its Results. Treatment was begun on 19th March, and consisted in bathing the forearms in hot water, with a little bicarbonate of soda added to it, until the scales were removed, and a good, but not excessive, vascular reaction was established. The arms were then carefully dried. About half an ounce of 50 per cent. myelocene,[1] previously lique-

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Note 1. The diluent used was almond oil.

liquefied and warmed, was then applied to the skin of the forearms, and rubbed well into the parts in the manner best calculated to promote absorption. The latter operation involved about ten to fifteen minutes for each arm. No further treatment was adopted.

The diet was the ordinary one of the hospital ward in a workhouse, and included a liberal supply of porridge, which is frequently regarded as an article of diet to be avoided in such an extensive skin lesion. The treatment extended over two and a half months, and in its course particular attention was paid daily to the amount of vascular reaction attendant both on the application of the hot water and the myelocene and the duration and severity of these applications were varied from time to time in accordance with the information thus gained. A careful daily supervision of the treatment was found to be essential to success.

Result. Within ten days of the commencement of treatment there was a material improvement in the texture of the skin of the affected areas all over the body. The skin was softer and more pliable. In this period many large coarse scales had spontaneously shed, leaving the surface perfectly clean or covered with very fine scales.

Fig 14

Fig 15

After three weeks local treatment to the forearms

scales.

At this stage the varicose condition of the veins had distinctly lessened. (see Fig. 13.). This improvement could not be attributed to rest in bed, as the patient was not confined to bed for the first month of treatment, whereas he had been in bed for three weeks immediately prior to the taking of the original photograph (Fig. 11.).

Fig. 14. shows the condition of the posterior aspect of the body after three weeks' treatment. The general improvement was in reality more marked than is apparent in the figure. The rate of progress subsequently increased. The condition of the skin of the abdomen and flexor surface of thighs and legs was at this time equally satisfactory. After this date the rate of improvement slowed down. About this time there was a fresh eruption on the flexor aspect of the forearms, which was possibly a result of over-treatment.

Fig. 15. shows the condition of the posterior surface of the body after eleven weeks' treatment. The whole skin was then of normal texture, and indeed probably of softer consistence than was normal to the patient. The skin was also free from pigmentation, except that which was natural to the patient

patient as a vagrant, and which is visible in Figs. 12 & 14. in the healthy skin of the back. The eruption had now entirely disappeared from the whole body, with the exception of a few flat pale spots on the upper part of the buttocks and on the flexor aspect of the forearms. The soles of the feet and heels had been the last to improve. The cutaneous irritation was considerably diminished after a fortnight's treatment, and after five weeks had completely disappeared.

The urinary derangement. After six weeks' treatment the patient stated that he now had more control over his micturition both by day and night. Whereas prior to treatment he had been in the habit of going to the urinal nearly every hour in the day, and five or six times in the course of the night, he now passed water not more than three or four times in the course of the day, and not oftener than twice between 10 p.m. and 6 a.m. This improvement was maintained so long as the patient was under observation. The treatment appeared to influence the total amount of urine voided, the amount being at first increased (March 20-27),

March.

Date .	11	12	13	20	21	22	23	24	25	26	27
Oz. of urine	116	108	106	120	134	134	138	138	144	144	146

May.

Date . .	3	4	5	6	7	8	9	10
Oz. of urine	105	103	108	105	103	103	103	101

and subsequently returning to the patient's normal amount (see May 3-10). The amount of water passed was very large, considering that the patient took no water or other fluid except at meals.

The average specific gravity of the urine voided in the first few weeks of treatment was slightly lower than before treatment, 1011 v. 1016.

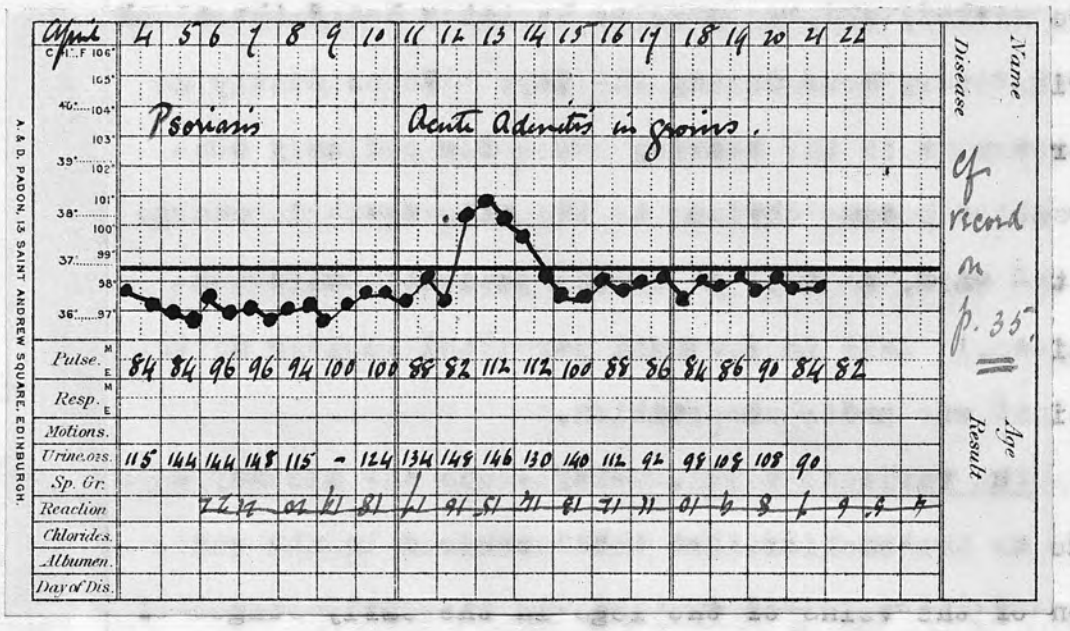
The condition of the fœces. Reference has previously been made to the abnormal appearance and foetid odour of the stools. In the course of treat-ment there was a pronounced improvement in this symptom, the motions became more natural in colour and much less offensive. They did not, however, reach a healthy standard, although they possibly be-came as normal as could be expected from a diet in which one meal was composed entirely of porridge, taken in a very large amount.

The hearing faculty. Four weeks after treat-ment had been in operation, the resident physician, Dr J. A. Douglas Thompson, observed that a conversati-on could now be carried on with the patient more

more easily than formerly. When spoken to on the subject, the patient stated that he himself a few days before had heard the ward clock strike the hour, for the first time since his admission to the ward six weeks previously. This improvement became more marked, and, as a rule, he later heard the clock strike every hour during the day.[1] Coincidently an improvement in the hearing power for ordinary conversation became obvious to the attendants in charge of the ward, as well as to the patient's ward companions. This improvement persisted so long as the patient was under observation.

The varicose veins. Reference has already been made to the amelioration that occurred in the condition of the veins of the legs in the early stages of treatment. The improvement was shown by a photograph taken after six weeks' treatment. It is not advisable to theorise regarding the causation of this improvement, but mention should be made of other two changes which occurred simultaneously with it. There was (a) a marked improvement in the flexibility of the skin generally, and (b) a distinct alteration in the character of the peripheral circulation, the change being mainly a relaxation of the arterial wall, with slight increase in pulse rate.

Note 1. The attention of the patient and the attendants had in no way been directed to this symptom.


April
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Psoriasis
Acute Adenitis in groins.
Pulse.
84 84 96 96 94 100 100 88 82 112 112 100 88 86 84 86 90 84 82
Resp.
Motions.
Urine.ozs.
115 144 144 148 115 - 124 134 148 146 130 140 112 92 98 108 108 90
Sp. Gr.
Reaction
Chlorides.
Albumen.
Day of Dis.
Name
Disease
of
record
in
p. 35.
Age
Result
A. & D. PADON, 13 SAINT ANDREW SQUARE, EDINBURGH.

rate.

Temperature. Before treatment, and for the first fortnight of the course, the patient's temperature (axillary) was subnormal, the average being $97^{0}.4$. An acute febrile attack occurred on 12th April, and for some time subsequently the average temperature was distinctly higher than the figure just quoted. (see Chart) On the morning of 12th April, the patient felt out of sorts and had a feeling of discomfort in the right groin. During the following night he felt at times "shivery," and at times "hot," and felt pain in both groins. On the morning of the 13th he looked pale and worried, pulse 108, respiration 22, had a bad taste in his mouth, and a painful enlargement of the inguinal glands in both groins, more especially on the left side, where the skin covering the glands was tense and of a delicate blue tint. Two hours later the pulse was 90, respiration 24. The amount of urine voided showed an increase rather than a diminution in quantity. Notwithstanding these acute constitutional symptoms, the general condition of the skin was very favourable, the diseased areas being actually paler and more natu-ral looking than ever previously. The treatment was not interrupted. These temperature changes

changes are specially instructive if compared with similar changes recorded in the earlier part of my thesis. P. 24. & 21

Subsequent history. When the last photograph was taken (Fig. 15.), the eruption had not entirely disappeared. The patient left the hospital in the beginning of June and has been seen several times since, the last occasion being in the beginning of April 1903. The history to that date is very satisfactory. There has been no recurrence of the eruption, and the relief from the urinary trouble has persister.

Remarks.

The special points to which attention is directed in this record--in addition to the recovery from the skin eruption--are

I. The very marked improvement in the urinary symptom. The cause of this symptom had never been determined. The record suggests that it may have been due to an early sclerotic change involving some part of the urinary tract, and that this was favourably influenced by the myelocene treatment.

II. The improvement effected in the hearing. The results of treatment indicate the existence of an intimate relationship between the internal ear affection (sclerosis) and that of the skin (sclerosis and crust formation).

III. The temperature changes. The acute febrile attack associated with pain and swelling of the inquinal glands was of great interest. I regard it as part of the vital reaction to the treatment employed.

Reference may now be made to some unsuccessful cases.

Case iii. Psoriasis of three years duration in a nervous choreic child.

A. W. aet 12. Suffered from mild Psoriasis of 3 years duration. Patient was treated in the Royal Hospital for Sick Children in 1899, for severe chorea. When in Hospital the Psoriasis was improved by local treatment combined with internal administration of arsenic, but returned to its former condition on cessation of treatment. Hereditary history showed a marked proclivity to psoriasis. The patient's father had suffered from wide spread Psoriasis 'all his life.' He illustrated in a striking manner the remarkable degree of improvement that occasionally occurs even in severe cases independently of any treatment. On one occasion the writer had remarkable evidence of this. Within 48 hours a very widespread eruption on the arms and legs had disappeared, except for the presence of very distinct areas of congestion in the originally crusted areas. The man assured the writer that equally sudden 'cures' had frequently occurred.

An uncle was also the victim of extensive Psoriasis of many years duration, but as this gave

gave him no trouble he had never been treated.

Photo 16. is a photograph of the child in question. The physiognomy is characteristic of a highly strung nervous child -- with a delicate skin and slight degree of anaemia. The Psoriasis is adequately depicted in photo 17 .

This patient was thoroughly tried with treatment by myelocene applied locally to the affected patches after removal of the crusts, but without success. On the cessation of treatment the condition soon returned to its former state. One noteworthy point was spontaneously remarked on by the patient's home people, viz., coincidentally with treatment the patient's 'nervousness' practically disappeared. Prior to treatment patient was a very nervous child who had exhibited many fine muscular movements of the facial and other muscles, such as are present in children with a disposition to chorea. The amelioration in this symptom was spontaneously remarked on by her home people, and this improvement persisted for about six months, when the 'nervousness' returned.

In this case it is obvious that the absorptive areas from which the bone marrow could be absorbed was a very small one. This may or may not have

have been the cause of failure; in any case the record stands as a case which was completely unsuccessful from the point of view of local treatment of the skin eruption by the use of myelocene. The next case -- which was equally unsuccessful -- illustrates another type of the disease.

Case iv. Psoriasis of Guttata, of seven years duration in a case of severe melancholia with suicidal tendencies.

This patient was an inmate of Morningside Asylum. He had mitral stenosis. The eruption was of a hard and shotty nature, a very typical Psoriasis Guttata see Photo 18 . The intervening skin was intensely dry, hard and inelastic. The pulse was inordinately slow, 60 to 70; the temperature was continuously subnormal. From its nature this case was regarded as one unlikely to derive benefit from the treatment. As a preliminary measure the patient was immersed in hot water for 15 to 20 minutes every day for 5 days. This treatment was not successful in relaxing the peripheral circulation, a fact which further confirmed the unfavourable prognosis. The local use of myelocene applied to the arms only, and carried out every day for three weeks, appeared to the Dr in charge, to the Nurses in charge and to

to myself, to effect a distinct softening of the general skin surface without any striking amelioration of the eruption spots. The pulse rate increased markedly, ranging from 80 to 90; the temperature chart showed oscillations in an upward direction. The nurses and Dr reported that the mental condition was for a time appreciably improved. From the point of view of a cure of Psoriasis, the case is chronicled as an unsuccessful one. Attention is however drawn to the changes in the pulse as above described. An extensive experience of the remedy has led me to associate such changes with the treatment by myelocene

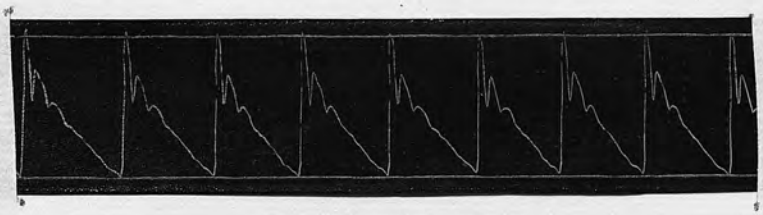
Some cases respond to treatment at the outset in a remarkable way, and thereafter the improvement continues but very slowly. The following is a typical illustration of this group. The patient was sent to me by the late Dr Stewart Stirling, as one eminently suitable for testing the treatment.

Case v. Psoriasis (extensive) of over 20 years duration.

The Patient -- a tailor aet. 45 -- had been affected with the Psoriasis continuously for over 20 years. He stated that on two occasions a prolonged course of treatment by chrysarobin had been carried out while an out patient of the Skin Department of the Royal Infirmary. A very slight improvement had been

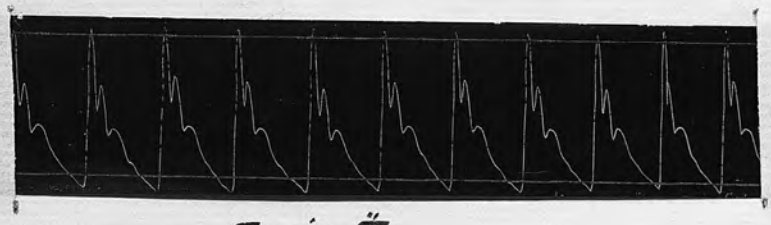
been effected by this treatment. The nature and extent of the eruption is well shown in the illustration (see Photo 20). For a week treatment was carried by myself, the duration of each treatment being approximately one hour. A remarkable improvement was effected in this time, both in the parts that were directly treated and in other areas that were not directly submitted to treatment. All the itching ceased. The change which occurred in the condition of the nails in these eight days was a very striking one and is depicted in Photo 22 & 23. It will be observed that the nails had increased in length and had otherwise improved in appearance. The patient stated that it had not been necessary for him to cut his nails for many years, as they had been kept 'worn down' by scratching. Coincidentally with this improvement in the skin condition, the patient's general health improved. He lost his former habitual 'down-spiritedness', and felt generally better than he had done for many years. In this case also a very striking alteration in the condition of the circulation occurred coincidentally with treatment. The pulse increased markedly in rate and the vessel walls became more relaxed. Several pulse tracings were kindly taken for me by an independent

independent expert Dr Oliphant Nicolson. Tracing i, illustrates the condition of radial pulse taken before treatment, when the rate was 58, the average of 3 readings on different days being 60.



Tracing I

After eight days treatment the pulse rate was eighty, the average reading of 4 successive days being 82. The alteration in the character of the pulse is shown in the second tracing, taken on the tenth day of treatment.



Tracing II

The subsequent progress of this case was slow, a fact which I attribute as at any rate in part due to the difficulties of satisfactory treatment being effected by the patient himself. The degree of improvement attained with a fortnight's treatment is shown in Photo 21. He left Edinburgh within three months, when the larger areas were almost entirely healed, the smaller ones were only slightly improved.

improved.

Case vi. Psoriasis of 5 months duration.

Another unsuccessful case may be briefly cited as it illustrates a point to which attention should be drawn. This patient, a girl of sixteen, was sent to me by Dr Giles, who had previously tried the usual external remedies, including chrysarobin, with out avail. The condition of the limbs is shown in Photo 24 . There was a strong hereditary history of the disease. Treatment by bone marrow was carried out assiduously and thoroughly for four weeks, but without appreciable benefit. Thereafter a Chrysarobin ointment was tried and in a fortnight the Psoriasis had entirely disappeared. Nine months later there had been no trace of recurrence of the disease.

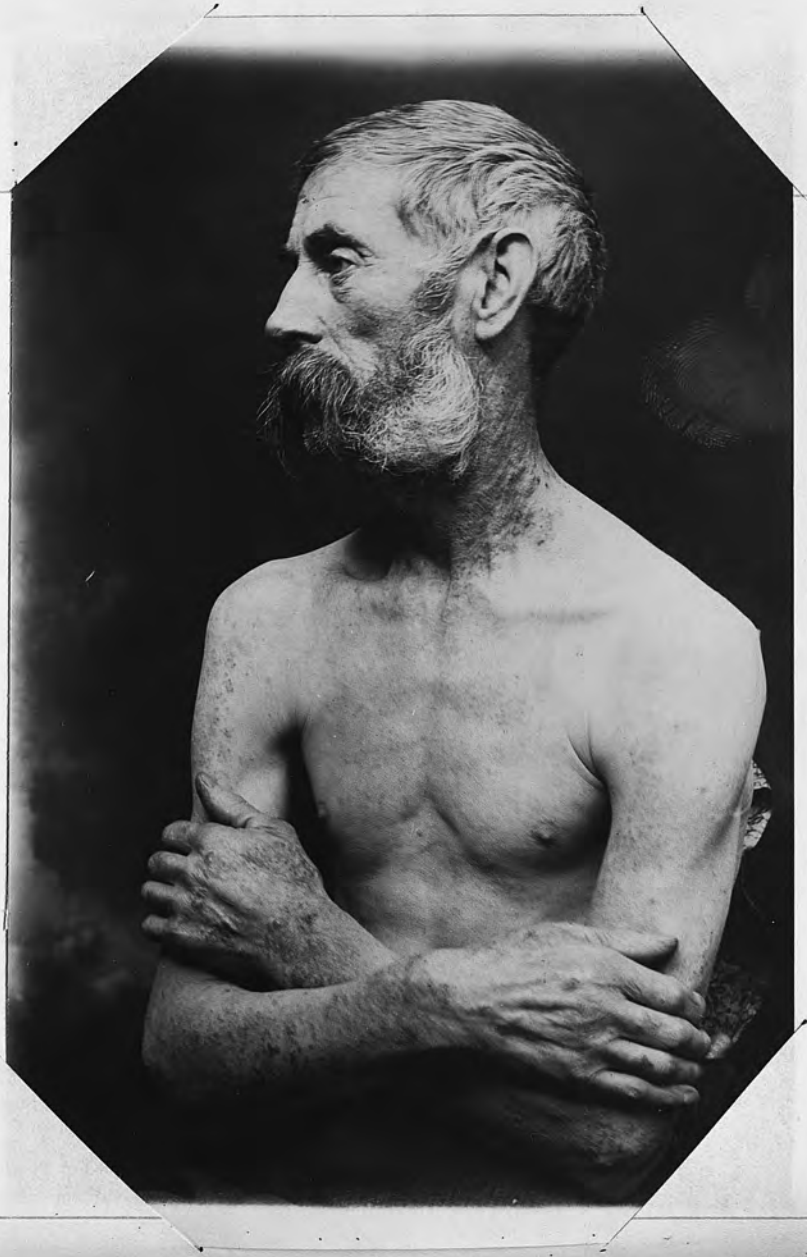
Remarks. This case suggested to me that the bone marrow had been of service in modifying the nutrition of the skin and tissues generally in a manner favourable to the influence of the external use of chrysarobin. I have obtained a confirmatory evidence of this view in other four cases of chronic skin affections.

Summary of Psoriasis Cases.

In all I have had the opportunity of treating 12 typical cases, nine of which had previously been under treatment by the ordinary remedies, without marked improvement resulting. In six of these cases the results were as satisfactory as those illustrated in Cases i and ii; these may be regarded as highly successful; in three the results were similar to those of cases iii and iv; these may be classed as failures. In three the initial improvement was very striking as in Case v, and the subsequent improvement being much slower; these may be regarded as partially successful.

Eczema.

We pass now to the consideration of the results of treatment of some cases of Eczema. As in the previous records, the cases treated represent a continuous series, the number of cases being small owing to the limited material at my disposal.



Eczema of five weeks duration.

A. B. aet. 54 was sent to me by the late Dr Stewart Stirling as a severe case of Eczema which had proved refractory to ordinary remedies. The patient was a plasterer's labourer who had been off work since the onset of the Eczema, five weeks prior to the date at which he came under my observation. He had suffered from a previous attack of a less severe nature two years previously and at this time he was laid off work for three months. His heart (left ventricle) was enlarged; the urine was free of albumin and sugar. The case was one of acute Eczema passing into the subacute stage. The condition of the face, neck, chest, and arms is shown in photograph 25. Round about the ear and upper part of the neck the eruption was of a moist and weeping character with much excoriation and crusting; the skin of the face and forehead was the seat of a markedly scaly eruption on an erythematous base; in the lower part of the neck, over the chest, and upper arms the eruption was of a papular character. The legs were the seat of a marked 'varicose' Ezcema as shown in Photo 27. . The irritation of the skin was severe, and seriously interfered with the patient's sleep. The treatment in this case consisted in bathing the fore-

Fig 27.

Fig 28

forearms and neck with hot water for a few minutes, and thereafter applying myelocene to these parts for about 20 minutes each day. This treatment was carried out by myself so as to ensure accuracy of observation. Improvement immediately occurred. All traces of itching disappeared within 48 hours. A few days later it was apparent that while some areas were rapidly healing, in other parts the disease was extending. This is well seen in Photo 26., taken after 14 days treatment, which shows that in the lower part of the neck the eruption has spread and become confluent. This Photograph shows also in a rather indistinct way that the eruption on the forearms and back of left hand is appreciably worse. The limbs were not directly treated. An improvement in the state of the legs occurred coincidentally with the improvement elsewhere. Here also it will be observed that the disease has considerably extended (see Photo 28 taken after 14 days treatment). The Photograph shows that the veins of the foot are now less distended. The subsequent progress of this case was extremely satisfactory; the patient was shown to the Edinburgh Medico Chicurgical Society within five weeks of the outset of treatment and at this time the skin was completely healed. He resumed work immediately afterwards, and, although his

his work is of a very trying nature there had been no trace of recurrence after nine months.

Summary of Cases of Eczema.

In all eight cases have been treated. In five of them the result has been as gratifying as in the case just recorded; in two of them--cases of eczema of the head after erysipelas--no improvement followed a fortnight's treatment; in the remaining case--a child aet 4 with eczema of the arm which had resisted treatment with ordinary applications carried out for two months at the Outpatient Department of the Edinburgh Hospital for Women and Children--no improvement attended the local application of myelocene as usually applied, but when the parts were covered up with an ointment consisting of equal parts of myelocene and Ung. Acidi Borici., improvement immediately occurred, the skin being entirely healed in five days. It has to be noted that as myelocene is in no way antiseptic, it cannot be applied in the form of an ordinary ointment.

The results then may be interpreted as indicating that the bone marrow contains a substance or substances of distinct therapeutic value in the treatment of eczema. It will have been noted that hot water was used freely and daily as a pre-

preliminary to the treatment of myelocene. This was used on account of its stimulating influence on the cutaneous circulation, and regardless of the ~~fact that the~~ teaching of dermatologists that the application of water is to be rigidly avoided in these cases.

The next record is one of a rather rare affection. Keratosis Pilaris, in a young subject. In this case I was fortunate to secure a piece of the skin for histological examination. As the disease is one of considerable interest I took the patient into a private home for some weeks so as to obtain a more complete medical record. As in preceding cases particular attention is directed to the associated symptoms and signs of disease in organs others than the skin. At the request of the Editors of the British Journal of Dermatology the case has been recorded in that Journal.

KERATOSIS PILARIS,

With Special Reference to

The Vascular Changes in the Skin.

Description of the Case. William P., aged 6, a small, thin, poorly developed boy, was sent to me in March, 1903, by Dr Isabel Venters on account of a peculiar skin eruption on the buttocks, thighs, and neck, which had existed for about eight months and was progressive.

Family History. The mother is not strong, but has had no serious illnesses. The father is stated to be delicate, and is markedly bald for his years. One sister, with whom the patient sleeps, has a very slight eruption on the posterior axillary folds, of a nature similar to that on the patient.

Past personal history. When he was under two years of age the patient was under my care in the aural department of the dispensary suffering from chronic suppurative middle-ear disease. This proved not amenable to simple local treatment, and after a time he was sent to the surgical department of the Royal Hospital for Sick Children for the removal of

of enlarged tonsils and adenoid growths. A continuation of appropriate local treatment still effected no improvement, and six months later a radical post-aural operation was carried out in the same institution. The operation was followed by a diminuition in the discharge, which, however, still remained copious. At later intervals a similar radical operation was performed on two occasions by an expert aural surgeon. Some months after the last operation the discharge from the ear practically ceased, but the sinus behind never entirely closed. When he was about four years old he was very severely burned all over the right side of the body, and was treated in the wards of the Royal Infirmary for over eight months.

Present illness. In July, 1902, the mother observed that the patient's skin was becoming very rough, noticeably on the buttocks, back of thighs and neck, and posterior axillary folds. Shortly afterwards small papular elevations developed and projected like spines from the surface of the skin. The patient was never inclined to play; he had a capricious appetite, often eating immoderately; he was inclined to sit beside the fire continuously. At the time of observation (March, 1903) the eruption was

PLATE I.

ILLUSTRATE DR. CHALMERS WATSON'S CASE OF KERATOSIS PILARI

was stated to be progressive.

Present condition. The patient is a small, thin, poorly developed boy, with the expression of an old man.Fig 29. The skin of the right side of the face and a large part of the trunk shows a cicatrix, the result of a burn. The skin of the buttocks, posterior and lateral aspects of the thighs, and extensor aspects of the neck and axillae is the seat of a well-marked skin eruption. This consists in numerous papular elevations of a conical nature, many of the elevations being pierced by a short, thick, black stump of a hair which projects straight outwards (Fig. 30.). Many of the elevations present a very characteristic spinous appearance. The intervening skin is dry, inflexible, and void of any appearance of hair. There is an entire absence of hair on the trunk and limbs, with the exception of the forearms, which merely show the faintest indications of the presence of hair. The hair of the head is dry and lustreless, and shows marked indications of early senile baldness. This is equally pronounced on the two sides of the head. The bowels are constipated and the motions are very offensive. The average pulse-rate of five observations taken over three days is 65. The foregoing facts may now be summarised as

PLATE II.

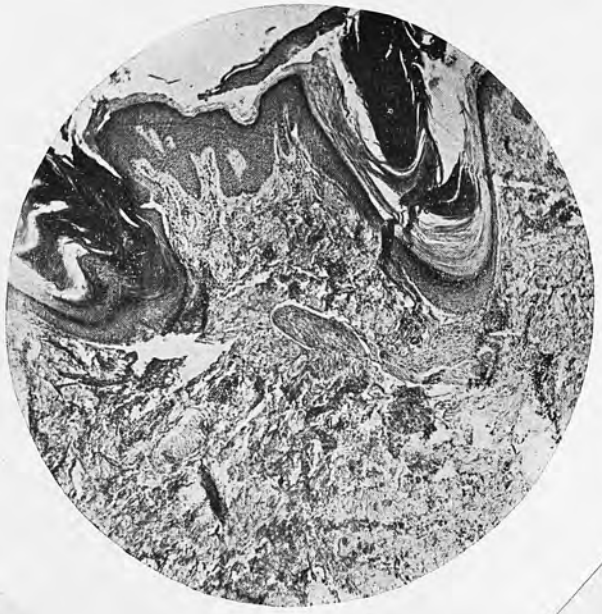


FIG. 31.

FIG. 32.
KERATOSIS PILARIS.

PLATE II.

FIG. 31.—Skin from the buttock of case of Keratosis pilaris. The section shows: *a*. The mouths of two pilo-sebaceous follicles distended with horny material which stains deep red with eosin. *b*. Thinning and atrophy of the rete mucosum, round *a*. *c*. At the bottom of the funnel the cells of the rete are more faintly stained. On high-power examination the cells here are large, spherical, and homogeneous, and are relatively very few in number, with a larger amount of intercellular material. *d*. In the centre of the field is seen one of the arrectores pilorum, which is probably slightly hypertrophied. Between it and the bottom of the funnel are seen traces of sebaceous glands. The dark band alongside the deeper part of the funnel is the much thickened sebaceous duct. *e*. The corium is increased in thickness, and shows an increase in number of cells in the papillary layer. × 50.

FIG. 32.—Note (i) the increase in thickness in the corium. (ii) Small-cell infiltration of the papillary layer of the corium, in special relation to the blood-vessels. (iii) The remains of some sweat-glands, considerably disorganised from fibrous tissue proliferation, are seen in the deepest part of the field, on the right-hand side. (iv) Some increase in thickness of the rete mucosum. × 50.

as follows:- A skin eruption of the nature of Keratosis pilaris, with which is associated defective development of hair all over the body, early senile baldness, an abnormally slow pulse, and constipation with foetid stools. With regard to the name of the eruption, I attach little importance to the particular term employed. So far as I can judge from the literature, the following terms would be equally appropriate, viz., Lichen pilaris, Lichen spinulosus, Pityriasis pilaris, Keratosis follicularis, Keratosis suprafollicularis (Unna), and Keratosis pilaris (Crocker).

Histological examination. A biopsy was made and a small piece of skin excised from the buttock. At least fifty sections of this skin were submitted to a careful histological examination, and for purposes of control a piece of skin was excised from the skin of the buttocks of two children of the same age who died from tuberculosis. The following pathological states were observed:-

Cutis vera. (a) The cutis vera was markedly thickened (see Figs.). It showed an excess of fully formed fibrous tissue, and also a great increase in the number of small round-cells in the

PLATE III.

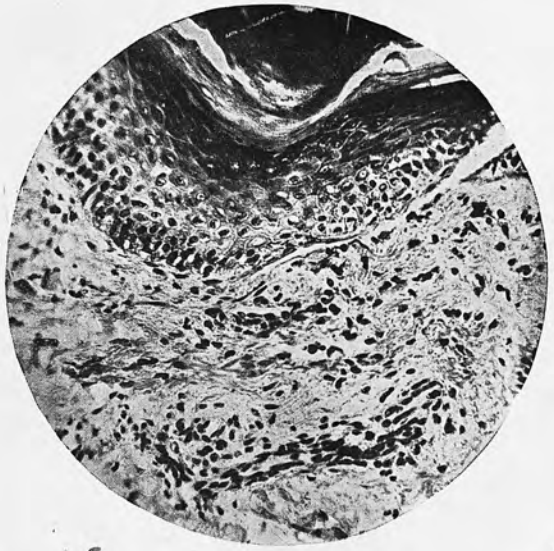


FIG. ± 33

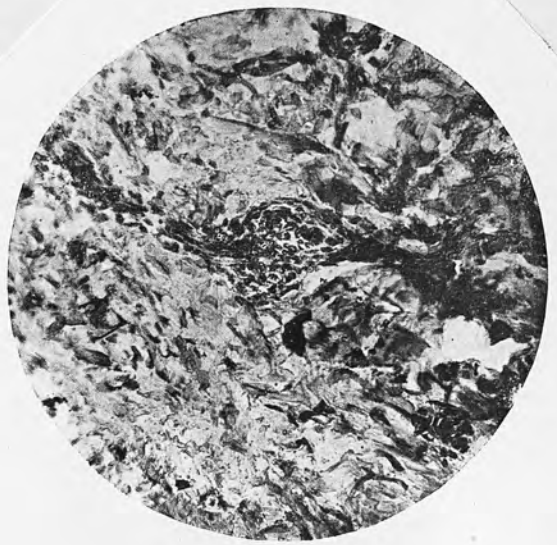


FIG ± 34

KERATOSIS PILARIS.

PLATE III.

33
FIG. ±—Shows a considerable degree of small-cell infiltration of superficial part of the corium. This is most marked around the vessels, one of which is seen in the lower part of the field. × 200.

34
FIG. ±—Note in the centre of the field a localised cellular thickening of a vessel wall; the fibres of the corium present an irregular, swollen, and hyaline appearance, which is absent in the control specimens. × 200.

the papillary layer (see Figs. 33). The fibres of the corium presented a swollen hyaline appearance Fig 34.(b) The walls of the blood-vessels were thickened, due to an increase in the number of cellular elements, both in the walls and around the vessels (Figs. 33). Fig. 34 shows a small local dilatation of a vessel with cellular infiltration. (c) The skin glands; only traces of sebaceous glands were found (Fig. 31); these seemed to have disappeared. The sweat-glands were less involved; at places these were considerably broken up and disorganised from the presence of dense fibrous tissue. (d) The arrectores pilorum: at places it appeared as if these muscles were hypertrophied. This change, if present, was not pronounced.

The epidermis. The mouths of the pilo-sebaceous ducts are dilated into funnel-shaped openings and packed with masses of horny cells (see Fig. 31). The presence of this horny mass has produced thinning and atrophy of the rete. At the bottom of the horny layer in the follicle, the cells in the rete mucosum are relatively few in number, with a large amount of intercellular substance. Many of these cells are large, round, homogeneous cells which have stained faintly. Here and there the rete

rete mucosum is increased in thickness (Fig. 32). In the interfollicular areas the stratum corneum is not increased in thickness. The main histological features may thus be summarised:- A sclerosis of the cutis vera, with cellular proliferation of its papillary layer, marked thickening of the blood-vessels, imperfect hair development, and alterations in the sebaceous and sweat glands. ,

Further course and treatment. The patient was under continuous observation from March 14th until April 30th, the treatment being as follows:-

1. During the first ten days of treatment castor oil was administered on four occasions, attention being directed to the character of the stools. The diet was ordinary.

2. From April 3rd onwards the treatment was as follows:- (a) Daily inunction of the buttocks and thighs with myelocene applied for fifteen minutes, after a preliminary application of hot water to the part; (b) a small dose of sulphate of magnesia was given daily; (c) an occasional enema of plain water was administered, in all on five occasions.

The course under treatment may be summarised. In the first ten days a distinct improvement occured in the condition of the skin, the most noticeable

noticeable feature being an increased flexibility of the whole skin surface. A very marked improvement in the eruption occurred simultaneously with the commencement of treatment by myelocene, the improvement in two days being very striking. After a fortnight's treatment by inunction the skin of the buttocks and thighs was practically normal in appearance and texture. A week later, however, there was a slight recurrence of the eruption, associated with dark pigmentation of the skin. This pigmentation was pronounced, and is a point to which we draw special attention. Coincidently with the improvement in the condition of the skin there occurred a marked growth of fine hair in the normal situations all over the body. On May 1st all traces of the eruption had disappeared, not only from the parts locally treated, but from the neck and axillae, which had not been submitted to local treatment. At this date the patient was shown at a meeting of the Edinburgh Medico-Chirurgical Society, when the skin of the buttocks and other parts presented a perfectly normal appearance; attention was at the same time directed to the growth of hair on the forearms, which by this time was fairly luxuriant. Attention should further be directed to the following

following features in the progress of the case:-

(a) The general circulation: It was previously stated that the average of the first five records of pulse-rate was 65, an abnormally slow rate for a patient of his age. The rate of the pulse gradually increased, as shown in the following figures, which are averages for ten readings (night and morning) in consecutive periods:- 64, 65, 66, 68, 78, 75, 79. This increase in rate was attended by an alteration in character, the pulse acquiring a fuller volume, with a more relaxed vessel wall.

(b) The general health of the patient: Whereas previous to treatment the patient had been spiritless and disinclined for play, he now had for the first time the natural inclinations of a high-spirited urchin, and was incessantly in mischief. The patient has been frequently seen in the course of the six months, that have elapsed since the cessation of treatment, and the condition of the skin has remained normal.

Etiology of the disease. The full consideration of the possible causes of this peculiar skin affection necessitates a careful study of the general medical aspects of the case, also the study of the cutaneous manifestations of the disease, and the manner in

in which either or both of these were influenced by the particular treatment employed. This necessitates a brief recapitulation of the essential points, viz.:-

The occurence in a boy of six years of age of a skin eruption of the nature of Keratosis pilaris, associated with the absence of hair on the skin, early senile baldness, an abnormally slow pulse, and constipation with foetid stools; further, the antecedent history re the aural condition, the extensive burn, and also the hereditary history must be carefully considered.

The histological examination of the skin revealed a sclerosis or thickening of the corium with cellular infiltration in its papillary layer, marked thickening of the blood-vessels with cellular infiltration round them, imperfect development of hair, with alterations in the sebaceous, and to a less extent in the sweat-glands.

The course under treatment showed that the skin condition was, to all intents and purposes, cured by the adoption of measures directed to minimise septic absorption from the alimentary tract, along with the introduction into the patient's system, via the skin, of a product of bone-marrow which the writer has

has previously shown to possess undoubted value in the treatment of some skin affections. Further, the disappearance of the eruption was followed by the development of hair in its normal positions all over the body, a relaxation of the peripheral blood-vessels, with an increase in the pulse-rate, which had hitherto been abnormally slow, and an improvement in the patient's general health, which had now reached a standard never previously attained.

What interpretation are we justified in putting on these series of facts?

The clinical features of the case, the morbid histological appearances of the skin, and the results of treatment lead me to regard the condition as one of chronic irritation of and defective nutrition of the skin, the changes in the cutis vera being primary and the epidermic changes secondary, the circulating irritant acting primarily on the cutaneous vessels--inducing a condition of thickness and spasm,--the source of the irritant being in all probability the alimentary tract. The liability to such a chronic and latent infection in this patient was in all likelihood increased, due to the diminished powers of resistance resulting from the very severe chronic suppuration of the ear, the numerous operations, and

and the extensive burn referred to in the history. When we consider the extent to which the natural defences of the organism are bound up in the leucoblastic functions of bone-marrow, the rapidity of improvement which took place coincidently with the use of a preparation of bone-marrow is specially significant.

Previously recorded cases. The results of a very complete histological study of the disease have been recently recorded by Giovanni.[1] This observer records the results of the examination of twenty-five cases, and gives a good bibliography. In this, and in all previous records to which the writer has had access, the clinical records are restricted almost entirely to reference to the cutaneous system; and in the histological descriptions attention has been mainly focussed on the minute anatomy of the pilo-sebaceous follicles and their immediate neighbourhood, and relatively little attention has been paid to the blood-vessels. This is, I think, unfortunate, because the nutrition of the pilo-sebaceous follicles and other structures of the skin must depend largely on the existence of healthy vessels. It is true that in previous re-

Note 1. Archiv f. Dermat. u. Syph., vol. lxiii, 1902, p. 163.

records the existence of a cellular infiltration in special relation to the vessels has been frequently noted, but little or no etiological significance appears to have been attached to this fact. While no general conclusions can be drawn from a single record, the statement of the facts of this case warrants the recommendation that very special attention should be directed to the study of the blood-vessels of the skin in various diseased states, and also that the clinical records of such cases should not be too exclusively directed to the cutaneous system.

We pass now to the consideration of the results obtained in cases of Impetiginous Eruptions.

IMPETIGINOUS ERUPTIONS.

The favourable influence which myelocene had exerted on the catarrhal manifestations in lupus led to a more extended trial of the remedy in similar affections. The results were strikingly varied. In some cases the sequence of events left no room to doubt that the rapid improvement which occurred coincidentally with the use of this bone marrow preparation was directly due to the effects of the local treatment. In other cases no trace of improvement occurred. All the patients were treated daily by myself for one, two and sometimes three weeks. In most of the cases the home surroundings were of a very unfavourable nature. A few illustration cases may be given: the treatment in all of them consisted in bathing the affected parts with plain hot water for two or three minutes so as to remove any superficial crust and to promote the circulation in a manner favourable to absorption, and thereafter applying the warm fluid oil to the part. The oil was massaged ~~with~~ into the skin as far as the tenderness of the raw surface would allow; this operation usually occupied ten minutes.

minutes.

Impetigo of six week's duration.

Photograph 35 is taken from one of the first cases tried. The arms and legs and trunks of this subject showed numerous crusts like those seen in the illustration. Note the enlarged gland on the right side. The patient's mother stated that for several months the patient had been 'off his food.' The spots first appeared six weeks previous to date of observation and were extending. The improvement in this case was immediate, not only locally but generally. In two weeks the eruption on the back of the neck had largely disappeared, and the affected areas in other parts of the body were almost equally improved. Coincidently the patients appetite returned to an extent which surprised his mother, and led to her spontaneously taking notice of this fact. An interesting point was observed on the third day of treatment of this case. On that day the patient did not present himself for treatment, on account of violent sickness and vomiting for which there was no obvious cause. This symptom was quite a new one for the patient, and was I believe due to the action of the myelocene. Within three weeks of the outset of

of treatment the patient was shown at the Medico - Chirurgical Society. At this date the eruption was entirely gone, but the sites was very clearly indicated by numerous white scar like areas such as are shown in Fig. 36.

(Before referring to any other cases it is advisable clearly to indicate my belief that an equally favourable result to that shown in Fig. 36 would have been obtained by simple antiseptic treatment e.g. the use of a carbolic lotion, and the local application of a mercurial ointment. But in my experience this treatment would not have equally favourably influenced the untreated areas in the other parts of the body. In any case it is not my object to institute a comparison; my sole interest was to determine the presence or absence of any therapeutic property in the agent used).

Impetiginous Eczema of 14 days duration.

Photograph37 represents a more acute case. In addition to the crusts, the skin in surrounding parts showed pronounced erythema with areas of dry scaling. The nose was swollen, the eyelids showed old standing Blepharitis ciliaris.

Treatment in this case was also successful, and this patient was exhibited at the Medico Chirurgical Society a fortnight after the commencement of

of treatment. After this date no treatment was necessary. ~~Photograph 38 illustrates the altered facies of the patient, due largely to the disappearance of a general oedema of the face.~~

Impetiginous Eczema of three weeks' duration.

Photograph 39 is a case which did not in the least improve under treatment. The home surroundings of this boy were more favourable than in the other cases but after a fortnights treatment there was no appreciable improvement. On substituting simple antiseptic treatment the part gradually healed up.

Septic Dermatitis.

Another case may be cited as it presented some features of great interest. This patient's grandfather died of Erysipelas. The same affection attacked the grand~~father~~mother on the day of the husband's funeral, and she was sent to the Fever Hospital, where she lay for over two months. Two days after her removal to Hospital the child, who lived in the same house, developed a 'red spot' over each malar bone. In fourteen days the appearance on the left cheek was as shown in the Photograph.40. It appeared

appeared to the writer that this was really a manifestation of Erysipelas.

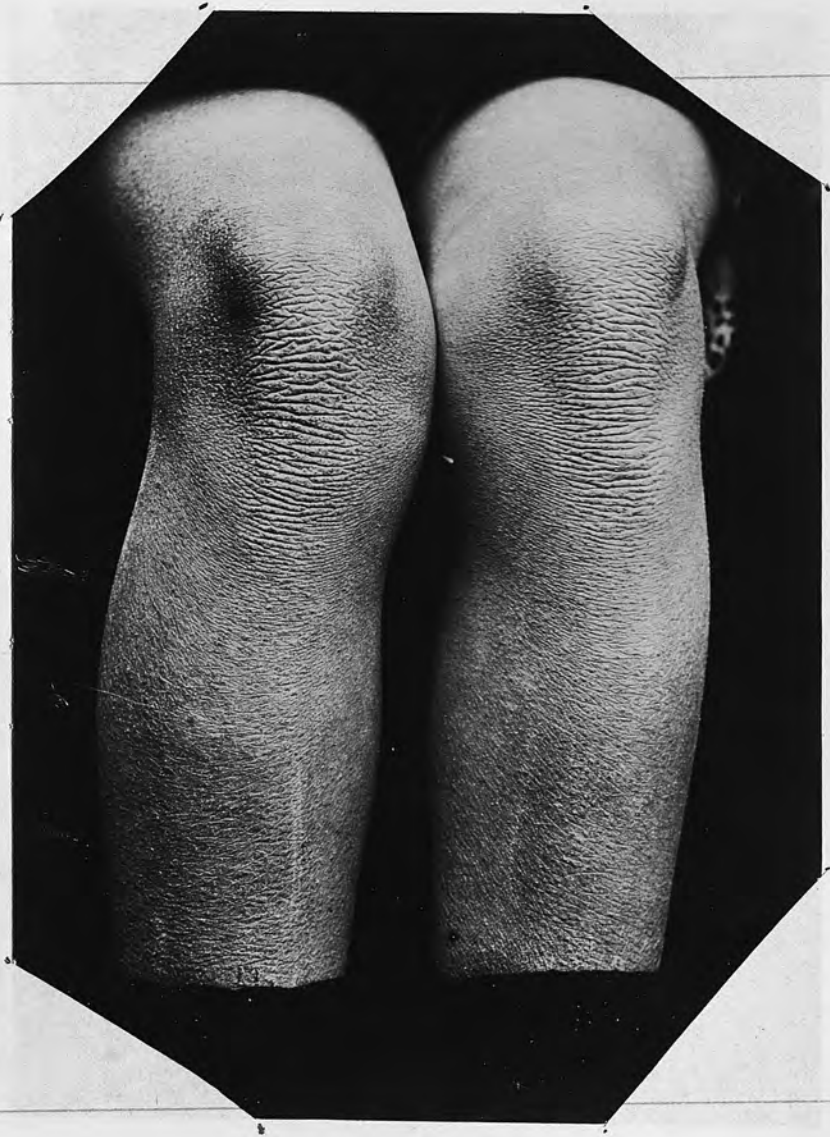
Treatment in this case was successful to a surprising degree. Photograph 41 represents the improvement which occurred in the first five days of treatment. This patient was shown at the Medico Chirurgical Society within 10 days of the commencement of treatment, when the condition was almost cured. It is interesting to note that 6 weeks later there was a recurrence of the eruption but to a less degree, on the chest and abdomen. On this occasion ordinary antiseptic remedies were employed and the parts healed very slowly.

General Summary of Results in Impetiginous Cases.

In all ten cases have been treated. In four cases, including the three recorded, the results of treatment were highly favourable, in three no improvement whatever occurred, and in the remaining three the results were only partially successful.

The favourable manner in which some of the cases reacted to the bone marrow treatment while others appeared entirely uninfluenced by it, may perhaps be explained by the varying degree of virulence of the bacteria concerned. It is however unnecessary to push this point further as a satisfactory solution could not be arrived at without a detailed bacteriological investigation of the cases.

The next record describes the results of treatment in a few cases of Simple Ichthyosis.



Ichthyosis Simplex.

Four cases of the milder type of Ichthyosis have been treated. Photographs 42 represent one of the cases. It will be observed that the skin of the face appears to be rough, dry and scaly; this condition was habitual. The Ichthyotic condition of the skin of the legs is well seen in Photo 43 . A very distinctive feature in these cases in the writer's experience is the absence or rudimentary state of the hair of the skin. On the skin of the forearms and legs of this particular patient there was an entire absence of the hair natural to these regions. Here and there a short single and apparently thickened hair projected vertically outwards, but otherwise the skin was hairless. The hair of the head in this patient was well grown but in other two cases this was very short and scanty. Another feature common to these cases was the state of the peripheral circulation. The pulse was abnormally slow, and the capillary reaction of the skin was deficient. All of these cases were treated in the Summer and Autumn of 1902, the treatment being carried out for six weeks. A very marked improvement was effected in all the cases . The most striking and interesting feature in the cases

cases was the development of a natural growth of hair in the normal situations all over the body. This point was illustrated and explained at a meeting of the Medico Chirurgical Society at which the patient was shown at the cessation of treatment. At this period the skin of the legs and trunk presented a natural appearance, and showed a luxuriant growth of fine hair. To contrast with this case, her sister who had not been treated was also shown at the same meeting. Coincidentally with the improvement in the skin there occurred a corresponding improvement in the state of the peripheral circulation; the pulse rate increased, the walls of the radial vessels relaxed, and the capillary reaction increased. The later history of these four cases is interesting. The full degree of improvement attained persisted for some months and the condition of the skin throughout the following winter was much better than it had ever been. Two of the cases have since been lost sight of. The condition of the skin in the patient (Fig. 42) at this date January 1904, shows that the improvement has not been fully maintained; the skin is again very scaly but markedly softer and more pliast than formerly.

In connection with these cases it has to be

be noted that treatment was only carried out for six weeks, and in all cases was devoted to the external application of myelocene applied once daily.

The next case (Verrucae Planae Juveniles) was not treated by Myelocene. It is recorded however with the object of drawing attention to the influence of toxic substances absorbed from the gastro-intestinal tract on the skin. Reference has already been made to this in former parts of my thesis.

VERRUCAE PLANAE JUVENILES.

The patient, a boy aged 13, presented himself at Marshall Street Dispensary for treatment of a skin eruption. Dr W. T. Ritchie, Visiting Physician to the Dispensary, diagnosed the condition as one of Verrucae, and kindly handed the case to the writer for observation and treatment.

History of the Case. Spots appeared on the face about six months previously, but it was only in the last three months that they had assumed the warty appearance now present. They appeared to increase in size and number after an attack of influenza to which he was subject about five weeks before he sought advice. Small growths of a similar nature had existed in the hands for a year or more, and a much larger warty growth had been present on each shin for about two years. There were no subjective symptoms other than disfigurement. The patient's general health was stated to be in all respects excellent. The hereditary history furnished no facts of importance.

Present Condition. The skin of the face, nose and forehead was studded with numerous small flat eleva-

elevations, varying in size from the head of a pin to a pea (see Fig 44). These were of firm consistence, and their surface presented a delicate pink or faintly yellow tinge. There was a tendency to confluence of the warty elevations on the bridge of the nose, and a linear arrangement on the middle of the cheek, which was ascribed to the results of a scratch received some months previously. The unaffected skin on the lower part of the cheek was rough, dry and slightly scaly.

The Hands showed the presence of a few typical warts (verrucae vulgaris) and in addition a number of flat nodular elevations (verrucae planae) similar in appearance to those on the face. The latter were of more recent origin.

The Legs. On each shin there was present a large warty growth, about the size of a small marble. Its surface presented a very characteristic "cauliflower-like" appearance.

The patient's general health was found to be in all respects satisfactory, with the exception of a definite history of constipation, which had existed for the past year.

Subsequent Progress and Treatment. The case was kept under daily observation for several days, and

and it was noticed that a distinct alteration in the size and colour of the warts took place. There was a slight diminuition in the size of the warts on the face, and a more marked alteration in the colour, which now assumed a faintly yellow tint. With the view of determining the presence or absence of micro-organisms, incisions were made into some of the most prominent warts on the face, and cultures were made at the laboratory of the Royal College of Physicians, Edinburgh. The result was entirely negative. The photograph (Fig 44) was taken immediately before treatment was begun. This consisted in the internal administration of a tablespoonful of castor oil, this being given on two occasions during the first week and once each week subsequently. This dose effected very free evacuation of the bowels after each administration. A material improvement in the condition of the face was evident after eight days, and in three weeks the improvement was very pronounced. The warts had now disappeared, the general skin surface being slightly rough with a tendency to scaling (see Fig. 45 from a photograph taken after three weeks' treatment). Coincidently with this improvement of the face, the conditions of the hands markedly improved, all the recent warts having disappeared,

disappeared, leaving only one or two of the common warts on each hand. Three weeks later[1] the latter also had disappeared. The large wart on each leg (mother warts) had undergone no change.

Remarks on the Case. The case is a typical example of a rather rare affection, and the special features to which I wish to draw attention are:-

1. The variations in size and appearance of the warts on the face that were observed when the case was under daily observation for some days before the photograph was taken or any treatment was begun.

2. The disappearance of the verrucae planae on the face and hands, and the improvement in the verrucae vulgaris of the hands subsequent to the administration of large doses of an aperient medicine. This suggests that a chronic infection from the alimentary canal is an important etiological factor in some of these cases, and at the same time may afford an explanation of the variations in size and appearance just referred to.

In this connection it is of interest to note that the two classes of medicinal remedies that are

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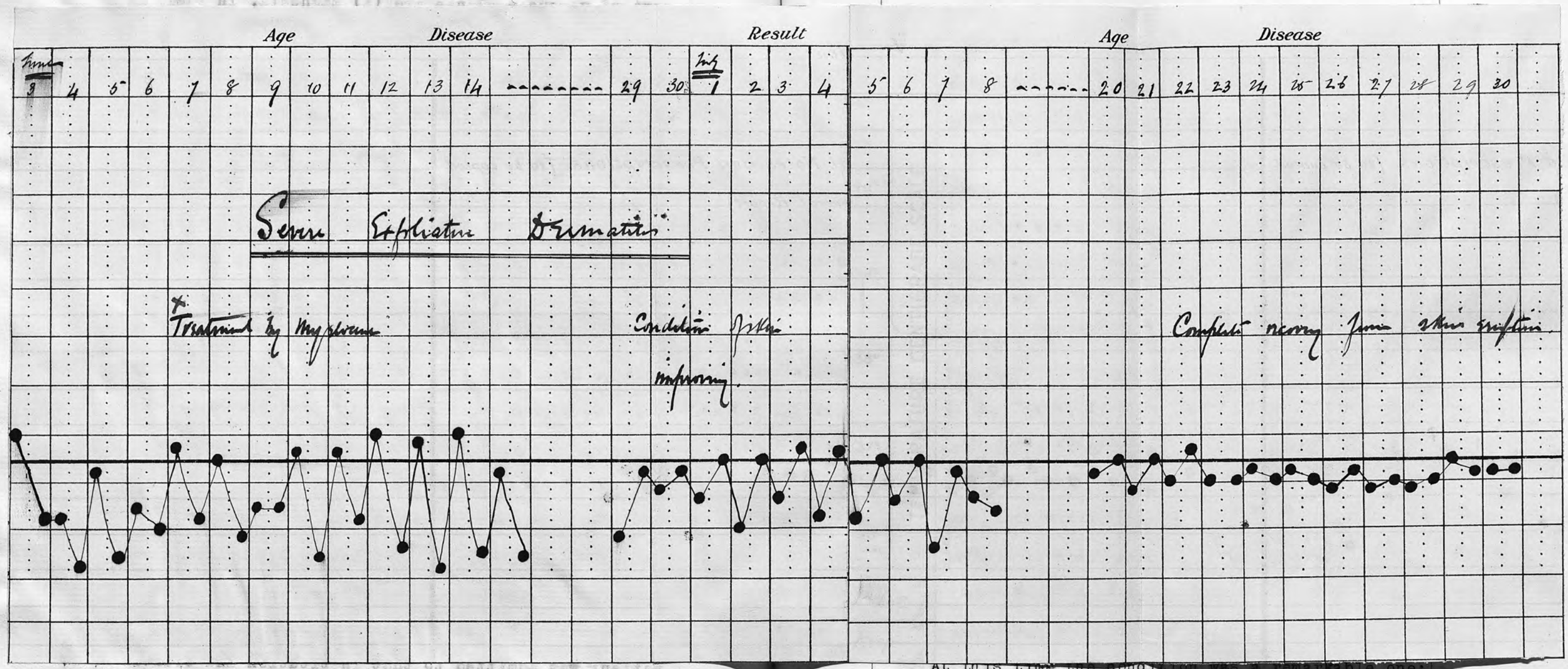
Note 1. At this date the patient was shown at the Edin. Med. Chir. Soc., July, 1902.

are recommended by most authorities for the treatment of verrucae planae are (a) magnesia, in small oft-repeated doses sufficient to induce an aperient action (Crocker), and (b) the internal administration of arsenic, a remedy which has been proved to possess a stimulating action on bone marrow (Stockman). It is conceivable that the manner of action of these two classes of substances is substantially the same, the aperient getting rid of a focus of septic absorption, and thus enabling the forces of nature, e.g., the bone marrow, to reassert themselves; the arsenic inducing a greater functional activity of the bone marrow, which, there is good reason to believe, is a most important means of natural defence in the organism.

The last case to be recorded was a very severe and intractable form of exfoliative Dermatites. Through the kindness of one of the Physicians to the Edinburgh Hospital for Women and Children the patient was admitted to that institution and treated under my supervision.

GENERAL EXFOLIATIVE DERMATITIS.



At this time the condition was a remarkable one; the redness and scaling of the skin of the face was intense, and had precluded her from mixing in society for over ten months. The skin all over the body was dry, erythematous and scaly, and showed on the trunk a number of small warts which had developed coincident ly with the general eruption. The skin of the legs

GENERAL EXFOLIATIVE DERMATITIS.

Miss M. aet. 70, was in the Skin wards of the Royal Infirmary for over six weeks in the winter of 1901 - 1902 suffering from very severe general exfoliative dermatitis. This involved the skin all over the body, the peeling on the cheek being very marked and necessitating patient wearing a thick black veil. Treatment in the Royal Infirmary which consisted in daily baths, and application of ointments of different kinds produced no permanent benefit. After leaving the Infirmary patient was an Inpatient in the Chalmers Hospital for six weeks, and was thus treated by bran baths, ointments, etc., but without appreciable benefit. According to patients statement she was thus discharged as the Physicians considered the case not likely to benefit by any further treatment. The patient was admitted to Bruntsfield Hospital under Mrs Chalmers Watson in the beginning of June 1902.

At this time the condition was a remarkable one; the redness and scaling of the skin of the face was intense, and had precluded her from mixing in society for over ten months. The skin all over the body was dry, erythematous and scaly, and showed on the trunk a number of small warts which had developed coincidently with the general eruption. The skin of the legs

legs presented an intensely hard dry and ichthyotic appearance, the scaling from the legs being coarser than on other parts of the body. The skin of the soles of the feet was immensely hypertrophied. There was some general irritation of the skin, but the subjective symptoms were remarkably slight. The previous history of the patient was unimportant; the hearing was impaired due to 'internal ear' disease.

Treatment. Patient was in the Hospital for ~~ten~~ two months, pulse and temperature observations were made every four hours; the motions were studied, and the urine was collected and measured daily. The diet was ordinary. Medicinal treatment consisted in the use of a purgative as often as required, and the local application of myelocene by inunction to certain parts. One leg was not submitted to any local treatment. At the end of a months treatment, the local treatment was abated and Myelocene was given internally (Gr XV twice daily).

Results of treatment, This was in all respects satisfactory. Recovery was complete in two months, and two years later there has been no recurrence of the eruption (April 1904). The condition of the hearing power was ~~completely~~ carefully tested before and after treatment; no change was observed.

observed.

The special points to which attention is directed in this case are.

I. The temperature records.

II. The great benefit that followed the use of bone marrow, not only at the parts of application, but in dher areas not directly treated. It was noteworthy that at the end of five weeks the limb not directly treated presented a more normal appearance than any other part.

III. In contrast to case on p. 26 who also suffered from deafness of 'nerve' origin, no improvement in the hearing power coincidentally with the recovery from the sclerotic condition of the skin (etc.,).

The Preparation of Marrow used.

In my earlier investigations I was much impressed by the differences in the physical characters of the marrow product obtained by distillation. Clinical experience in the use of the different products some showed that these variations in physical characters were associated with variations in therapeutic activity. Variations in the general appearance and smell of a fatty product are more readily recognised than described; it was however found that a faulty extract had one or more of the following characters as compared with the extract desired.

1. It was different in colour, being less yellow and of somewhat lard like appearance.

2. The smell was 'heavier,' and less ethereal.

3. The melting point was from 10° to 40° degrees higher, and in some cases the fat never became clear on heating.

4. Parts of the fat separated out in crystalline form much sooner than in the good preparation. This appearance is explained by Dr Dott as "probably due to the glycerides having attained their full crystalline form."

5. It became rancid much more quickly.

Foot note. I should say that for 18 months or more the marrow was selected by myself once or twice a week and given to a reliable firm of Chemists (Baildon & Son, Edinburgh) for simple extraction and distillation in the open.

quickly.

An extract with the foregoing characters was frequently obtained from perfectly fresh bones, and, when applied to a raw surface as in one of the psoriasis cases recorded, was not only of no therapeutic value, but was actually harmful. I may add that the characters above described are present in a more marked degree in the extract from bones that are not 'perfectly fresh' -- that is in bones that have lain in a shop for two or three days or more after being stripped.

A second point is worthy of record. At the end of six months experimentation, it was thought advisable on the grounds of economy, to prepare the extract by distillation in a still rather than in the open. It was found that the product so obtained was not so satisfactory as that prepared by the open method. This is at the present time a serious drawback to the preparation of the substance on a commercial scale. This point at once suggests that the active principle may be of the nature of an enzyme that is destroyed by heat. I am satisfied that this is not the explanation, as I have on several occasions submitted 'myelocene' to a very high temperature (212°) for 10 to 15 minutes without any loss in its therapeutic

therapeutic activity.

The Chemical Composition of Myelocene.

Attempts were made to ascertain the exact Chemical Composition of Marrow which yielded a therapeutically active substance and marrow which was not therapeutically active. This examination was kindly made for me by D.B.Dott Ph.D. President of the Pharmaceutical Society, of the firm of J. F. Macfarlane and Co., Edinburgh, and a copy of his report is appended. The specimens marked Nos. 1 and 4 were known to me as 'good,' No. 2 as 'indifferent' and No. 3 as 'very bad.'

Abbeyhill Chemical Works,
EDINBURGH. April 25, 1902.

"Marrow: two pots marked No. 1, and No. 2, received from Dr Chalmers Watson. 100 grams of each was extracted with ether (.725 Sp. gr.): the ether completely evaporated, left in each case 75 grams of a pure white mass of a semi-crystalline appearance

These were examined in following manner. The melting point of each was determined, and a weighed portion saponified with alcoholic potash. After evaporation of the alcohol and addition of water, the fat acids were precipitated by sulphuric acid. The oleic Acid was determined by conversion into lead salts, and treatment of same with ether, which dissolves the oleate of lead and leaves behind the lead stearate and palmitate. The proportions of stearate and palmitate could not be accurately estimated by mean melting point, as there is evidently sufficient of a third acid present to lower the melting point. The Acid solution from the precipitated fat acids was shaken up with ether, and the latter evaporated at ordinary temperature. The residue was almost wholly soluble in a little cold

cold water, and probably contained traces of choline Hydrochloride as well as soluble fat acids.

The Cholesterin was determined by treating saponified watery solution with ether several times and evapora-tion to dryness. The Lecithin was estimated by extracting the substance with warm methylated spirit, evaporating, treating residue with boiling baryta water, filtering, precipitating the barium and evaporating solution to dryness. The result was extracted with absolute alcohol and the choline precipitated as platinochloride. From the weight of this the corresponding amount of Lecithin was calculated.

	No. 1.	No. 2.
M.P. of Eth. Ext.	95°F	100°F
" " " Fat Acids.	110°F	113°F
Cholesterin	.12	.24
Lecithin	.54	.49
Sol. Fat Acids	.37	.20
Olein	45.54	44.12
Stearin-Palmitin	52.90	53.94
Moisture etc.,	.53	1.01
	100.00	100.00

Note No. 1 gave 78 per cent of acetone extract
No. 2 " 83 " " " " "

D. B. DOTT.

Abbeyhill Chemical Works,
EDINBURGH. May 21, 1902.

Samples of Bone Marrow received from Dr Chalmers Watson, "marked No. 3 and No. 4. 100 grams of each was treated with 800 c.c. of ether of .725 sp. gr. added in successive quantities and well mixed before filtering. Ether completely evaporated, extract weighed and melting-point determined.

No. 3 gave 68.35 grams of M.P. 93°F
No. 4 " 67.75 " " " ". 92°F.

Analysed in manner as previously described.

	No. 3.	No. 4.
Olein	44.00	44.20
Stearin and Palmitin	53.80	53.50
Cholestrin	.42	.44
Lecithin	.71	.61
Moisture and undetermined substances	1.07	1.25
	100.00	100.00

It will be seen from the foregoing that a careful chemical analysis does not indicate any appreciable and constant difference in the conposition of good as opposed to bad or indifferent marrow. In subsequent consultations over other specimens of marrow, Dr Dott expressed the opinion that a mere chemical

chemical analysis is not likely to further our knowledge of the active principle or principles present in the marrow.

Reference may be made to some preliminary experimental observations that have been made to test the action of Myelocene; four experiments have been carried out involving the use of twelve rabbits. A simple control animal was used on each occasion, and also one in which an equal amount of olive oil was injected subcutaneously. It was found that the subcutaneous injection of myelocene produced a slightly 'leucoblastic' marrow. In arriving at this conclusion due care was taken to make culture observations from the seat of injection at the post-mortem. This line of investigation, involving as it does the use of fats, is one fraught with considerable difficulty, and very extensive observations would be nec-essary before conclusive results could be arrived at.

The Therapeutic Action of Myelocene.

In the writer's opinion the results recorded justify the conclusion that the bone marrow contains a substance or substances of distinct therapeutic value in the treatment of some skin affections. As has been frequently stated we are not concerned with a comparison of the results with those obtainable by other means. The point to which attention is directed is the fact that the remedy employed is an organic extract.

The results recorded have some significance re the etiology of the different skin affections; they suggest that there is some truth in the general theory outlined on page 4. The full consideration of this point is however beyond the scope of the present paper.

One word in conclusion. The results here recorded are only regarded as a preliminary communication directing attention to the results attained, and also to some of the difficulties that have to be overcome ere the explanation of these results is known. The problems raised are numerous and varied, and their solution will demand the combined investigations

investigations of physiologists, pathologists and clinicians.